What Works Clearinghouse

INSTITUTE OF EDUCATION SCIENCES

Elementary School Math September 14, 2006

Everyday Mathematics

Program description

Everyday Mathematics, published by Wright Group/McGraw-Hill, is a core curriculum for students in kindergarten through grade 6 covering numeration and order, operations, functions and sequences, data and chance, algebra, geometry and spatial sense, measures and measurement, reference frames, and patterns. At each grade level, the *Everyday Mathematics* curriculum provides students with multiple opportunities to learn concepts and practice skills. Across grade levels, concepts are reviewed and extended in varying instructional contexts. The distinguishing features of *Everyday Mathematics* are its focus on real-life problem solving, student communication of mathematical thinking, and appropriate use of technology. This curriculum also emphasizes balancing different types of instruction, using various methods for skills practice, and fostering parent involvement in student learning.

Research

Four studies of *Everyday Mathematics* met the What Works Clearinghouse (WWC) evidence standards with reservations. These studies included a total of approximately 12,600 students in grades 3–5 from a range of socioeconomic backgrounds and attending schools in urban, suburban, and rural communities in multiple states.[1]

Effectiveness

Everyday Mathematics was found to have potentially positive effects on students' mathematics achievement.

	Mathematics achievement
Rating of effectiveness	Potentially positive effects
Improvement index[2]	Average: +12 percentile points Range: –7 to +25 percentile points

1. The evidence in this report is based on available research. Findings and conclusions may change as new research becomes available.
2. These numbers show the average and the range of improvement indices for all findings across the four studies.

Additional program information

Developer and contact

Developed by University of Chicago School Mathematics Project. Published by Wright Group/McGraw-Hill. 220 East Danieldale Road, DeSoto, TX 75115. Web: www.wrightgroup.com. Telephone: 800-648-2970. Fax: 800-593-4418.

Scope of use

Curriculum development for *Everyday Mathematics* began in 1983. The developer reports that the curriculum is used in more than 175,000 classrooms by more than 2.8 million students. A second edition of the curriculum became available in 2001–02.

Teaching

Everyday Mathematics is structured differently for kindergarten than for grades 1–6. The kindergarten *Everyday Mathematics* curriculum is composed primarily of activities such as counting games, money exchanges, and puzzles. In grades 1–6, the curriculum is broken into units covering specific topics. The number of units per school year ranges from 9 to 12, depending on the specific grade and the topics covered. Each unit comprises 7 to 14 individual lessons. The developer offers multiple professional development options, such as user conferences and institutes, onsite professional development programs, and online courses.

Cost

Curriculum sets are bundled by grade and are available for kindergarten through grade 6 (grade 6 is beyond the scope of this report). For kindergarten, the Core Teacher's Resource Package costs $162.78 and includes Program Guide and Masters; Teacher's Guide to Activities; Teacher's Reference Manual (grades K–3); Minute Math; Assessment Handbook; Home Connection Handbook (grades K–6); Number Grid Poster; Content-by-Strand Poster; and Mathematics at Home (books 1–3). For grades 1–5, the Core Teacher's Resource Package costs $233.40 and includes Teacher's Lesson Guides (1 and 2); Teacher's Reference Manual; Assessment Handbook; Home Connection Handbook (grades K–6); Math Masters; Minute Math+; Posters; Content-by-Strand; and one set of Student Materials (student math journals 1 and 2). Supplemental materials and manipulatives are available separately and vary in price.

Research

Sixty-one studies reviewed by the WWC investigated the effects of *Everyday Mathematics.* Four studies (Carroll, 1998; Riordan & Noyce, 2001; Waite, 2000; and Woodward & Baxter, 1997) used quasi-experimental designs that met WWC standards with reservations. The remaining fifty-seven studies did not meet WWC evidence screens.

The Carroll (1998) study included 76 fifth-grade students in four classrooms from four school districts using *Everyday Mathematics* and a comparison group of 91 fifth-grade students in four classrooms from similar districts, matched on student demographics and geographical location. The intervention group had used *Everyday Mathematics* since kindergarten. The comparison group had used traditional basal mathematics texts at all previous grades.

The Riordan and Noyce (2001) study included 3,781 fourth-grade students in 67 schools in Massachusetts using *Everyday Mathematics* and a comparison group of 5,102 fourth-grade students in 78 similar schools, matched on baseline mathematics achievement scores and student demographics. Forty-eight schools in the intervention group had implemented *Everyday Mathematics* for four or more years (early implementers), and 19 schools had implemented *Everyday Mathematics* for two or three years (later implementers). The comparison group used 15 different textbook programs representing the instructional norm in Massachusetts, with the most commonly used programs being those published by Addison-Wesley, Houghton-Mifflin, and Scott-Foresman.

The Waite (2000) study included 732 third-, fourth-, and fifth-grade students in six schools using *Everyday Mathematics* and a comparison group of 2,704 third-, fourth-, and fifth-grade students in 12 similar schools, matched on baseline math achievement scores, student demographics, and geographical location. The schools in the intervention group were in their first year of

Research *(continued)*

implementing *Everyday Mathematics.* The comparison group used a more traditional mathematics curriculum approved by the school district.

The Woodward and Baxter (1997) study included 104 third-grade students in five classrooms in two schools using *Everyday Mathematics* and a comparison group of 101 third-grade students in four classrooms in one similar school, matched on student demographics and geographical location. The comparison group used the *Heath Mathematics* curriculum, a more traditional mathematics program.

Effectiveness

Findings

The WWC review of elementary school mathematics curriculum-based interventions addresses student outcomes in mathematics achievement.

The Carroll (1998) study reported a statistically significant positive effect of Everyday Mathematics on geometric knowledge. After accounting for pretest differences between Everyday Mathematics students and comparison students, the WWC determined that this finding was substantively important but not statistically significant. Based on this study finding, the WWC categorized the effect of Everyday Mathematics on geometric knowledge as being a substantively important positive effect.[3]

The Riordan and Noyce (2001) study reported a statistically significant positive effect of *Everyday Mathematics* on overall math achievement. Using school-level data provided by the authors, the WWC determined that this finding was statistically significant and substantively important for the 48 early-implementing schools. For the 19 later-implementing schools, however, the WWC determined the finding to be substantively important but not statistically significant. Based on this study finding, the WWC categorized *Everyday Mathematics* as having a statistically significant positive effect on overall math achievement for the 48 early-implementing schools and a substantively important positive effect for the 19 later-implementing schools.

The Waite (2001) study reported a statistically significant positive effect of *Everyday Mathematics* on overall math achievement. After accounting for the misalignment between the school as the unit of assignment and the student as the unit of analysis, the WWC determined that this finding was substantively important but not statistically significant. Based on this study finding, the WWC categorized the effect of *Everyday Mathematics* on overall math achievement as being a substantively important positive effect. The Waite study reported subtest results (concepts, operations, and problem solving). After WWC calculations, these results were found to be positive but not statistically significant. The subtest analyses do not factor into the rating.

The Woodward and Baxter (1997) study reported no significant effect of *Everyday Mathematics* on overall math achievement. After accounting for pretest differences between *Everyday Mathematics* students and comparison students, the WWC confirmed this finding. Based on this study finding, the WWC categorized the effect of *Everyday Mathematics* on overall math achievement as indeterminate. The study also reported subtest results (computation, concepts, and problem solving) and found a statistically significant positive effect on the concepts subtest. WWC calculations revealed a substantively important, but not statistically significant, positive effect for the concepts subtest and a substantively important, but not statistically significant, negative effect for the computations subtest. The subtest analyses do not factor into the rating.

Four studies examined outcomes in mathematics achievement: One study (Riordan & Noyce, 2001, 48 early-implementing schools) found statistically significant and positive effects. Three studies (Riordan & Noyce, 2001, 19 later-implementing schools;

3. The level of statistical significance was calculated by the WWC and corrects for clustering within classrooms or schools and for multiple comparisons. For an explanation see the WWC Tutorial on Mismatch. See the Technical Details of WWC-Conducted Computations for the formulas the WWC used to calculate statistical significance. In the case of the *Everyday Mathematics* report, a correction for clustering was needed.

Effectiveness *(continued)*

Carroll, 1998; Waite, 2001) found positive effects. And one study (Woodward & Baxter, 1997) found indeterminate effects.

Rating of effectiveness

The WWC rates interventions as positive, potentially positive, mixed, no discernible effects, potentially negative, or negative. The rating of effectiveness takes into account four factors: the quality of the research design, the statistical significance of the findings (as calculated by the WWC), the size of the differences between participants in the intervention condition and the comparison condition, and the consistency of the findings across studies (see the WWC Intervention Rating Scheme). The WWC found Everyday Mathematics to have potentially positive effects on mathematics achievement.

The WWC found *Everyday Mathematics* to have potentially positive effects on mathematics achievement

Improvement index

For the math achievement outcomes, the WWC computed an improvement index based on the effect size (see the Technical Details of WWC-Conducted Computations). The improvement index represents the difference between the percentile rank of the average student in the intervention condition versus the percentile rank of the average student in the comparison condition. Unlike the rating of effectiveness, the improvement index is entirely based on the size of the effect, regardless of the statistical significance of the effect, the study design, or the analysis. The improvement index can take on values between –50 and +50, with positive numbers denoting favorable results. The average improvement index for mathematics achievement is +12, with a range of –7 to +25.

Summary

The WWC reviewed 62 studies on *Everyday Mathematics.* Four studies met WWC evidence standards with reservations. These four studies found potentially positive effects on mathematics achievement. The remaining studies did not meet WWC evidence standards.

References

Met WWC evidence standards with reservations

Carroll, W. M. (1998). Geometric knowledge of middle school students in a reform-based mathematics curriculum. *School Science and Mathematics, 98*(4), 188–197.

Additional source:

Carroll, W. M., & Isaacs, A. (2003). Achievement of students using the University of Chicago School Mathematics Project's Everyday Mathematics. In S. L. Senk & D. R. Thompson (Eds.), *Standards-based school mathematics curriculum: Where are they? What do students learn?* (pp. 79–108). Mahwah, NJ: Lawrence Erlbaum Associates, Inc. (Study: Geometric knowledge of fifth- and sixth-grade students.)

Riordan, J. E., & Noyce, P. E. (2001). The impact of two standards-based mathematics curricula on student achievement in Massachusetts. *Journal for Research in Mathematics Education*, 32(4), 368–398.

Waite, R. D. (2000). A study of the effects of Everyday Mathematics on student achievement of third-, fourth-, and fifth-grade students in a large north Texas urban school district. *Dissertation Abstracts International, 61*(10), 3933A. (UMI No. 9992659).

Woodward, J., & Baxter, J. (1997). The effects of an innovative approach to mathematics on academically low-achieving students in inclusive settings. *Exceptional Children, 63*(3), 373–388.

Did not meet WWC evidence screens

ARC Center. (2000a). Everyday Mathematics: Glendale, CA. In *The ARC Center's implementation stories from the field*. Retrieved November 2, 2005 from www.comap.com/elementary/projects/arc//stories/glendaleprint.htm.[4]

ARC Center. (2000b). Everyday Mathematics: Kent, WA. In *The ARC Center's implementation stories from the field*. Retrieved November 2, 2005 from www.comap.com/elementary/projects/arc//stories/kentprint.htm.[4]

4. Does not use strong causal design: this is a qualitative study.

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Briars, D. J. (2004, July). *The Pittsburgh story: Successes and challenges in implementing standards-based mathematics programs*. Paper presented at the Everyday Math Users' Conference.[5]

Briars, D. J., & Resnick, L. B. (2000). *Standards, assessments—and what else? The essential elements of standards-based school improvement* (CSE Technical Report 528). Los Angeles: University of California, Los Angeles, Center for the Study of Evaluation, National Center for Research on Evaluation, Standards, and Student testing, & Graduate School of Education & Information Studies. Retrieved November 2, 2005 from www.cse.ucla.edu/CRESST/Reports/TECH528.pdf.[6]

Carroll, W. M. (1993). *Mathematical knowledge of kindergarten and first-grade students in Everyday Mathematics*. Chicago: University of Chicago School Mathematics Project.[5]

Carroll, W. M. (1995a). *Report on the field test of Fifth Grade Everyday Mathematics.* Chicago: University of Chicago School Mathematics Project, Elementary Component.[7]

Carroll, W. M. (1995b). *Third grade Everyday Mathematics students' performance on the 1993 and 1994 Illinois state mathematics test*. Chicago: University of Chicago School Mathematics Project.[5]

Additional source:

Carroll, W. M., & Isaacs, A. (2003). Achievement of students using the University of Chicago School Mathematics Project's Everyday Mathematics. In S. L. Senk & D. R. Thompson (Eds.), *Standards-based school mathematics curriculum: Where are they? What do students learn?* (pp. 79–108). Mahwah, NJ: Lawrence Erlbaum Associates, Inc. (Study: Third-grade Illinois state test.)

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Carroll, W. M. (1996b). Mental computation of students in a reform-based mathematics curriculum. *School Science and Mathematics, 96*(6), 305–311.[5]

Carroll, W. M. (1996c). Use of invented algorithms by second graders in a reform mathematics curriculum. *Journal of Mathematical Behavior, 15*(2), 137–150.[4]

Carroll, W. M. (1997). Results of third-grade students in a reform curriculum on the Illinois state mathematics test. *Journal for Research in Mathematics Education, 28*(2), 237-242.[5]

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Carroll, W. M. (2001a). *A longitudinal study of children in the Everyday Mathematics curriculum*. (Available from University of Chicago School Mathematics Project, http://social-sciences.uchicago.edu/ucsmp/EvalRep.pdf)[6]

5. Does not use a strong causal design: the study, which used a quasi-experimental design, did not establish that the comparison group was equivalent to the treatment group at the baseline.
6. Does not use a strong causal design: the study did not use a comparison group.
7. Intervention not relevant: this study evaluated a field test version of the curriculum, not the final version.

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Additional sources:

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Carroll, W. M., Fuson, K. C., & Drueck, J. D. (n.d.) *A longitudinal study of second and third graders using the reform curriculum Everyday Mathematics by the University of Chicago School Mathematics Project*. Unpublished manuscript.

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Fuson, K. C., & Carroll, W. M. (n.d.). *Summary of comparison of Everyday Math (EM) and McMillan (MC): Evanston student performance on whole-class tests in grades 1, 2, 3, and 4.* Unpublished manuscript.[5]

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SRA/McGraw-Hill. (2001b). *Everyday Mathematics student achievement studies: Volume 3*. Chicago: Author. (Study: Florida Comprehensive Assessment Test.)[5]

8. Does not use a strong causal design: the study, which used a quasi-experimental design, did not establish that the comparison group was equivalent to the treatment group at the baseline in a pretest measure of math achievement.

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For more information about specific studies and WWC calculations, please see the WWC Everyday Mathematics Technical Appendices.